electron user

Vol. 1 No. 1 October 1983

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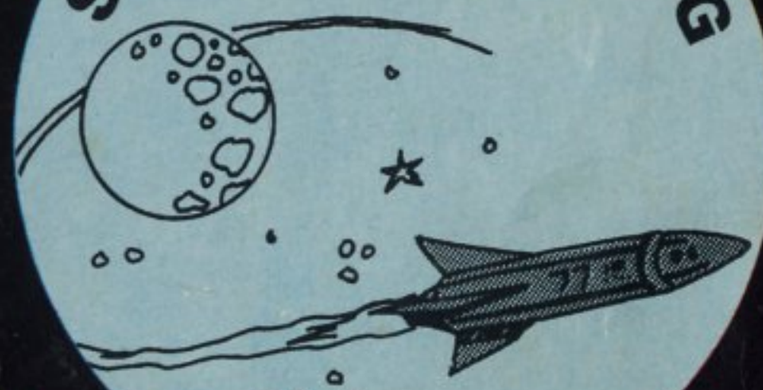

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Well and truly launched

AFTER months of speculation, the Electron has been finally launched with all the glitter of a show business first night.

Members of the computer press were ushered into the ballroom of the plush Park Lane Hotel to be greeted by a theatre set that would have done the Old Vic proud.

At the far end of the room was a large, "typical" detached house, from the front door of which stepped TV personality Cliff Michelmore.

His welcome to the press was par for the course. He implied that we were witnessing an important, if not historic event: the launch of a microcomputer that truly ushered in the era of the home computing.

We then settled back to watch a film (projected onto a convenient garage door) that extolled the power and virtues of the micro-chip in increasingly exaggerated terms.

All this provoked an outburst from the audience. Several of the journalists turned to see who had beaten them to the punch.

From the outer darkness appeared Wendy Craig, playing the role of a poor little housewife, baffled by all this, sceptical of the use of microcomputers in the home and not wanting to be blinded by science . . .

From then on Cliff and Wendy treated the audience to a catalogue of microcomputer cliches and truisms. The gimmicks included Wendy talking to the Electron (which of course answered back) and a sequence in which she had a dialogue with a screen "twin" whose Electron had enhanced her life beyond measure.

Behind the drama of the launch, there was a very serious intent. Said Chris Curry, managing director of Acorn: "We believe the home computer has at last grown up. With the Electron, the micro is no longer just a clever toy for bright children.

"It is an all-purpose intelligent tool – a tool that can educate, entertain, help run the home and be a window on a vast expanse of electronic information".

Acorn see the Electron becoming a familiar part of home life. The believe that it will bring microcomputing to people as yet untouched by the computer revolution – particularly women.

Continued Chris: "At Acorn we also see our approach to home computing as a first step towards combating a major problem of computing today – the non-involvement of women.

"A recent survey spelled out the dangers. Girls are 13 times less likely than boys to use a micro at home, and only 4 per cent of micro users are mothers.

"We hope that the combination of the Electron's educational pedigree and its potential application in so many areas relevant to women will help to reverse this trend".

Only time will tell if the Electron will achieve this goal. What is certain is that with this exceptional machine. Acorn are off to a flying start.

ALL the program listings printed in Electron User are also suitable for keying into the BBC Micro. Any exceptions will be indicated by the sign on the left, together with any changes in the listings that might be necessary.

Whether you're one of the proud few who own an Electron, or one of the many waiting to collect one . . .

Welcome to Electron User!

THIS is the first issue of a new magazine devoted entirely to the world of Acorn's latest computer – the Electron.

Month by month we'll be showing you how to make the most of your Electron. Its many special features place it far ahead of the competition, and we'll explain how to use them to full advantage.

As you can see already, we'll have plenty of listings for you to enter – games, graphics, educational and domestic programs. We'll cover the lot.

We will be using our first-rate team of writers to ensure that, beginner or expert, you'll find articles that you really understand.

The important thing is that Electron User is written by Electron users for Electron users. We're very keen to hear how you think the magazine should be going – and we'll act on any good ideas put forward.

And, of course, we're more than willing to consider your latest "Electronic" explorations for publication.

At the moment we're coming to you courtesy of our big brother, The Micro User. From December onwards we'll be a big magazine in our own right.

Now that's a Christmas present that no Electron user can be without!

electron user

Electron User welcomes program listings and articles for publication. Listings should be accompanied by cassette tape or disc. Send to:

Electron User, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

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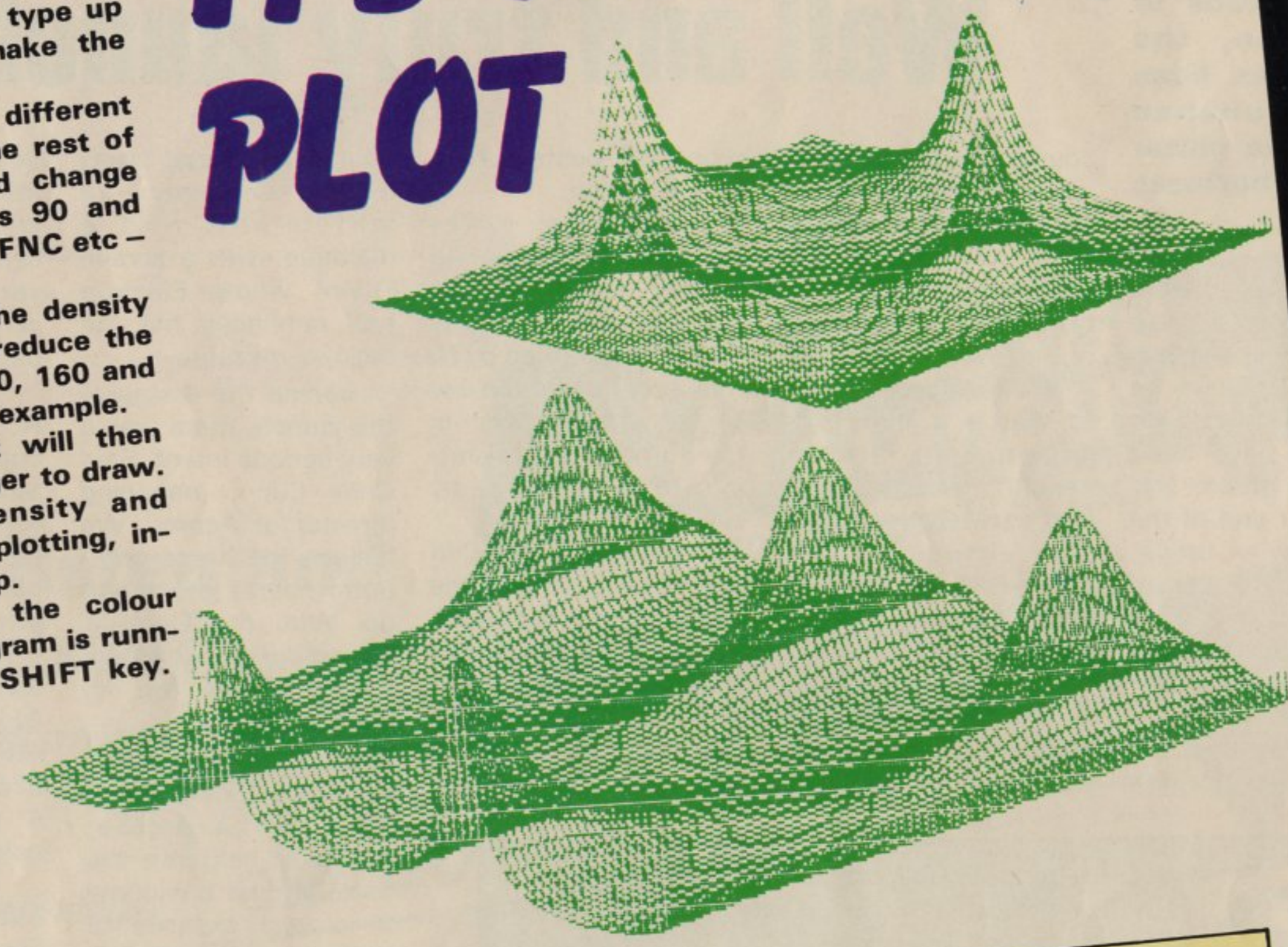
IT'S ALL A PLOT



HERE'S a short program to draw three-dimensional shapes on your Electron. You only need to type up to line 260 to make the program work.

If you want a different shape, type in the rest of the program and change the FNA in lines 90 and 200 to FNB – or FNC etc – up to FNH.

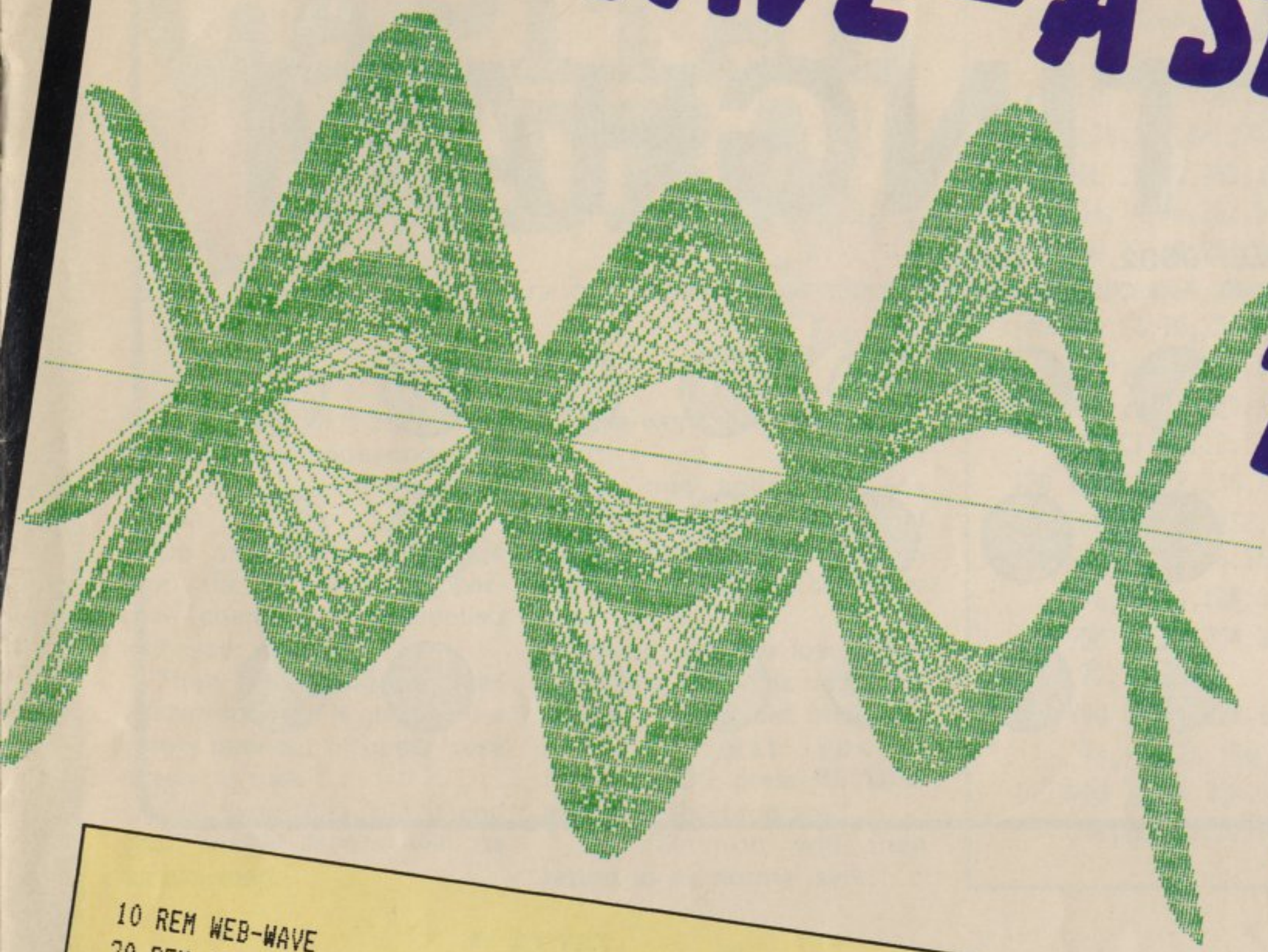
To increase the density of the picture, reduce the step lines 50, 70, 160 and 190 to 0.1, for example.

Note that it will then take much longer to draw. To reduce density and speed up the plotting, increase the step.

To change the colour while the program is running press the SHIFT key.

```
10 REM 3D-PLOT
20 REM (C)ELECTRON USER
30 MODE 0
40 X=0
   :Y=0
50 VDU 29,0;400;
60 FOR Y=0 TO 8 STEP .5
70 A=69
80 FOR X=0 TO 8 STEP .5
90 GCOL 0,7
100 PLOT A,80*(Y+X),(Y-X+2+
    FNA(0))*30
110 A=5
120 IF INKEY (-1)
    THEN VDU 19,7,RND(7);0;
130 NEXT X
140 GCOL 0,7
150 DRAW 80*(Y+8),(Y-X+4)*30
160 NEXT Y
170 FOR X=0 TO 8 STEP .5
180 PLOT 69,80*X,-6*X+12
190 GCOL 0,0
200 FOR Y=0 TO 8 STEP .5
210 PLOT 5,80*(Y+X),(Y-X+2+
    FNA(0))*30
220 IF INKEY (-1)
    THEN VDU 19,7,RND(7);0;
230 GCOL 0,7
240 NEXT
   :NEXT
250 END
260 DEF FNA(A)
270 =1/(COS (X*2)*TAN (X*2)*
    COS (Y/2)+1.1)
280 DEF FNB(A)
290 =1/(COS (X/2)*COS (Y/2)+1
    .1)
300 DEF FNC(A)
310 =1/(COS (X)*COS (X)*
    COS (Y)+1.1)
320 DEF FND(A)
330 =(X*COS (Y)/2)*(Y*
    SIN (X)/2)
340 DEF FNE(A)
350 =1.5/(COS (X)*SIN (Y/2)+1
    .1)
360 DEF FNF(B)
370 =1/(COS (X)*SIN (Y)+1.1)
380 DEF FNG(C)
390 =1/(COS (X)*SIN (X/2)*
    COS (Y)+1.1)
400 DEF FNH(C)
410 =1/(COS (X)*SIN (X)*
    COS (Y)+1.1)
```

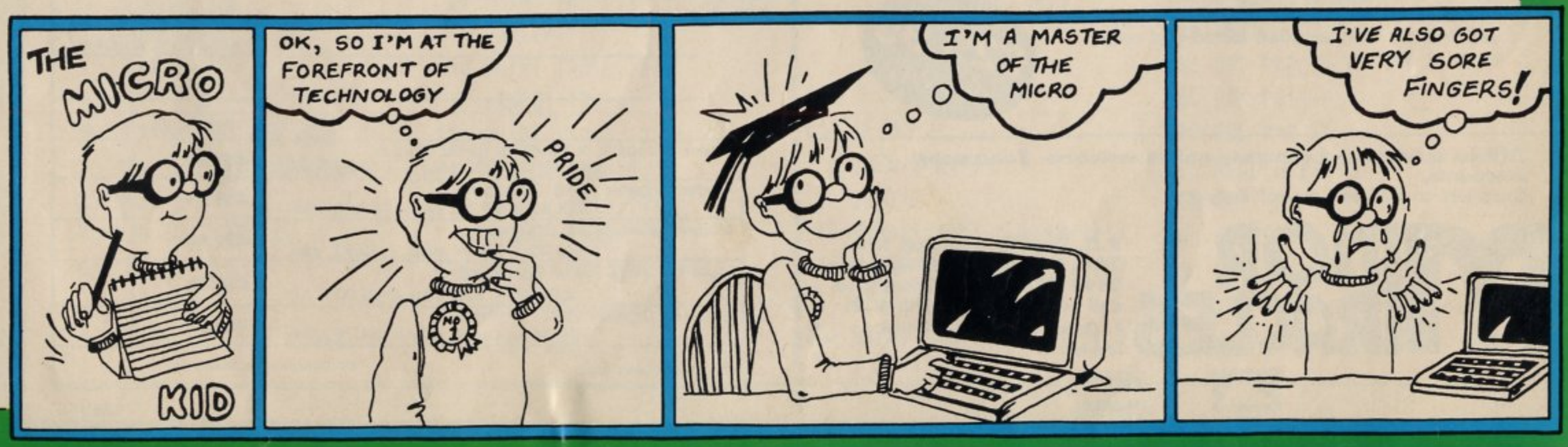
WEBWAVE - A SINE OF THE TIMES?



THIS listing uses your Electron's superb graphics facilities to picture three interacting sine waves in different colours.

If you don't know what a sine wave is, don't worry, just admire the art work!

```
10 REM WEB-WAVE
20 REM (C)ELECTRON USER
30 MODE 6
   :PRINT "I'm doing some calculatin
   g..."
40 DIM C(255)
   :FOR I%=0 TO 255
   :C(I%)=COS (I%/20)
   :NEXT
50 DEF FNcos(A%,B%)=C(A%/5)*B%
60 MODE 1
   :VDU 23;8202;0;0;0;
70 DRAW 0,1023
80 DRAW 1279,1023
90 DRAW 1279,0
100 DRAW 0,0
110 VDU 29,0;511;
120 MOVE 0,0
   :DRAW 1279,0
130 PROCCurve(1,500)
140 PROCCurve(2,-350)
150 PROCCurve(3,200)
160 REPEAT UNTIL FALSE
170 DEF PROCCurve(COL%,HEIGHT%)
   C%=30
   :GCOL 0,COL%
180 REPEAT MOVE 0,HEIGHT%
190 FOR X%=0 TO 1279 STEP C%
200 DRAW X%,FNcos(X%,HEIGHT%)
210 NEXT
220 C%=C%+5
230 UNTIL C%>325
240 ENDPROC
```



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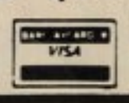

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TMU10

A CAPITAL IDEA

ARE you tired of the same old boring letters appearing time and time again on your screen?

Do you want a change from the run-of-mill upper-case character set supplied with your Electron?

Then this program was written for you. It gives you a whole new set of upper case letters to use.

Just type it in, run it and your capital letters will be transformed.

One word of warning however:

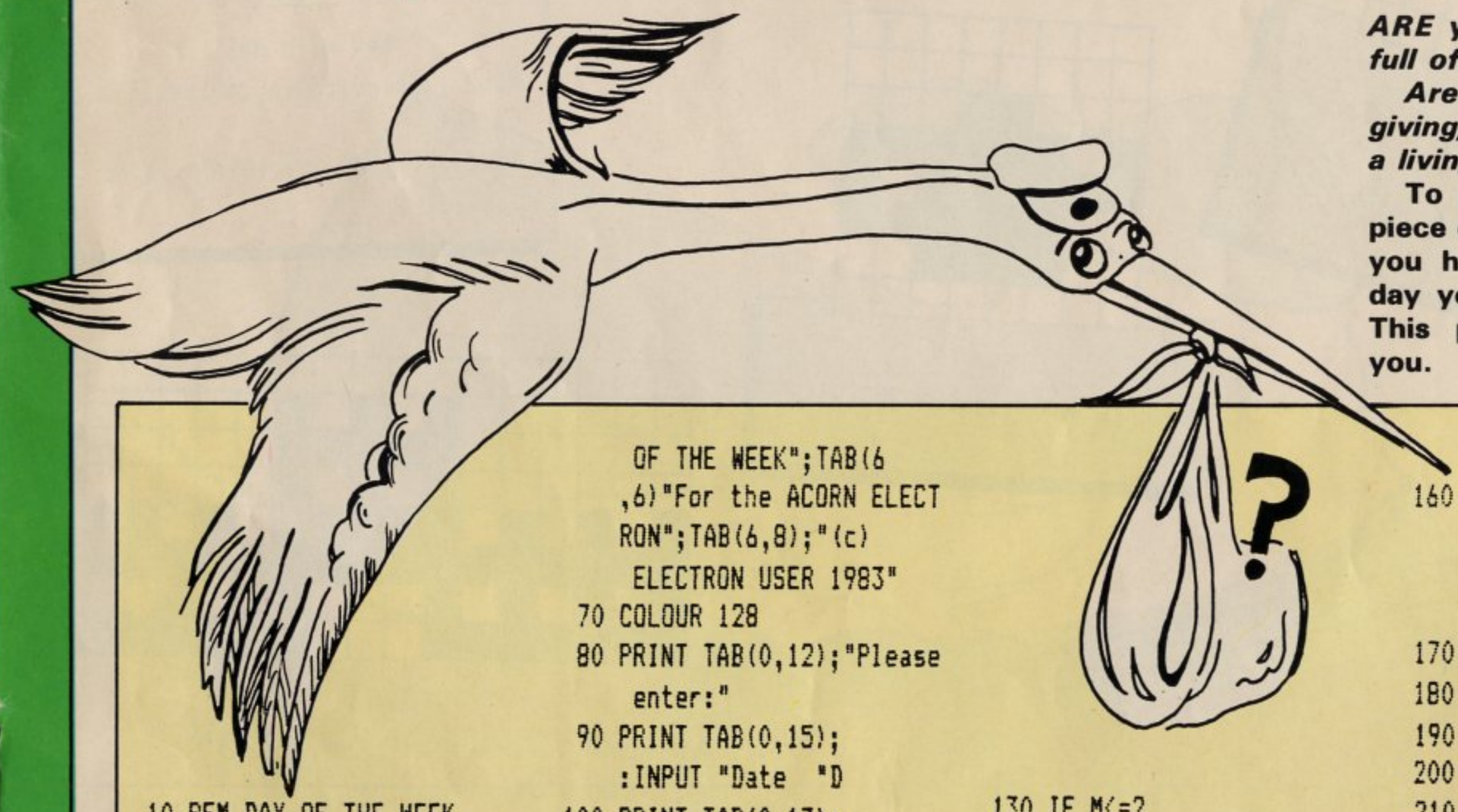
You may notice that line 30 changes the value of PAGE. This is to make room for the expanded character set.

If you want to load other programs after this using the normal, boring old character set then just type in PAGE=&E00, press RETURN and load the program.

The Electron will then return to its normal self.

```
10 REM CAPITAL IDEA
20 REM (C) ELECTRON USER
30 *FX20,5
40 PAGE =PAGE +&500
50 VDU 23,65,56,68,68
   ,68,124,68,238,0
60 VDU 23,66,240,72,72
   ,124,66,66,252,0
70 VDU 23,67,124,68,128
   ,128,128,68,124,0
80 VDU 23,68,252,18,34
   ,34,34,66,252,0
90 VDU 23,69,254,64,64
   ,240,64,64,254,0
100 VDU 23,70,254,64,64
   ,240,64,64,64,0
110 VDU 23,71,120,68,64
   ,128,142,132,124,0
120 VDU 23,72,238,68,68
   ,68,124,68,238,0
130 VDU 23,73,56,16,16
   ,16,16,84,124,0
140 VDU 23,74,254,8,8,72
   ,72,72,48,0
150 VDU 23,75,228,68,88
   ,96,120,76,196,0
160 VDU 23,76,224,64,64
   ,66,66,70,252,0
170 VDU 23,77,40,108,84
   ,84,84,84,214,0
180 VDU 23,78,198,100,84
   ,84,84,76,198,0
190 VDU 23,79,60,36,66
   ,66,66,36,60,0
200 VDU 23,80,252,66,66
   ,252,64,64,224,0
210 VDU 23,81,60,66,66
   ,82,74,68,58,0
220 VDU 23,82,252,66,66
   ,240,80,88,198,0
230 VDU 23,83,124,130,128
   ,120,4,132,120,0
240 VDU 23,84,126,82,16
   ,16,16,20,60,0
250 VDU 23,85,238,68,68
   ,68,68,68,56,0
260 VDU 23,86,238,68,68
   ,108,40,40,16,0
270 VDU 23,87,198,84,84
   ,84,84,108,40,0
280 VDU 23,88,198,100,28
   ,48,104,76,198,0
290 VDU 23,89,238,68,68
   ,68,56,16,124,0
300 VDU 23,90,252,132,140
   ,48,66,66,126,0
```

What day were you born?



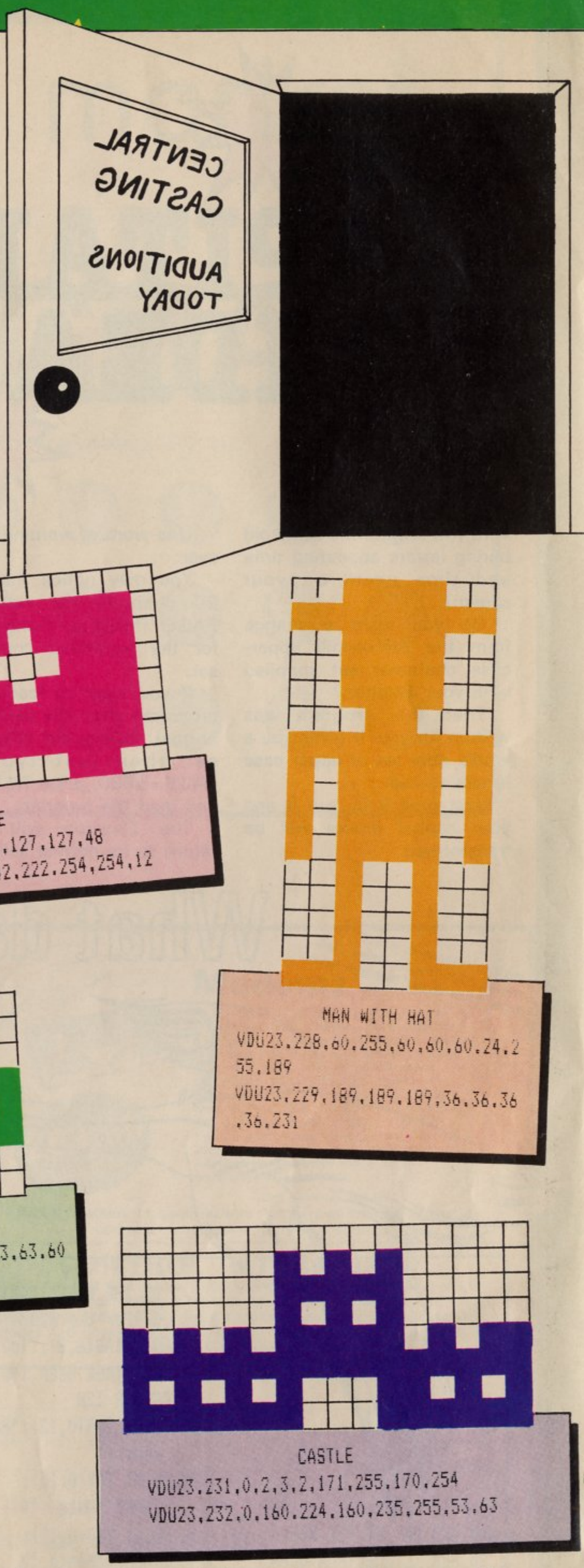
ARE you fair of face or full of grace?

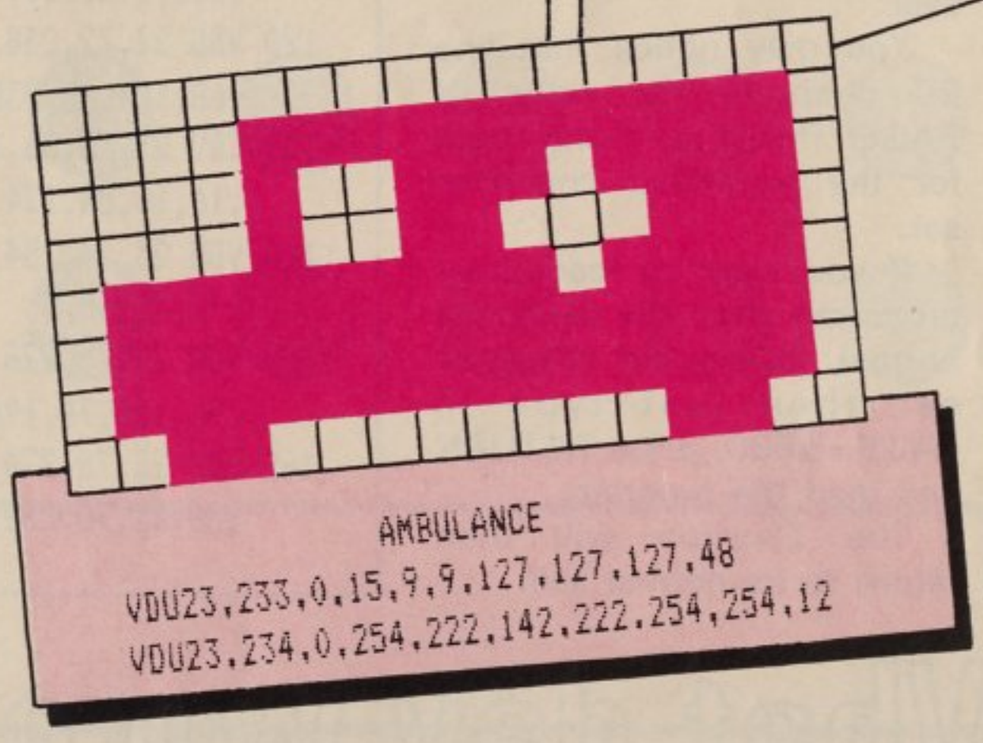
Are you loving and giving, working hard for a living?

To posses this initial piece of self-knowledge you have to know the day you were born on. This program will tell you.

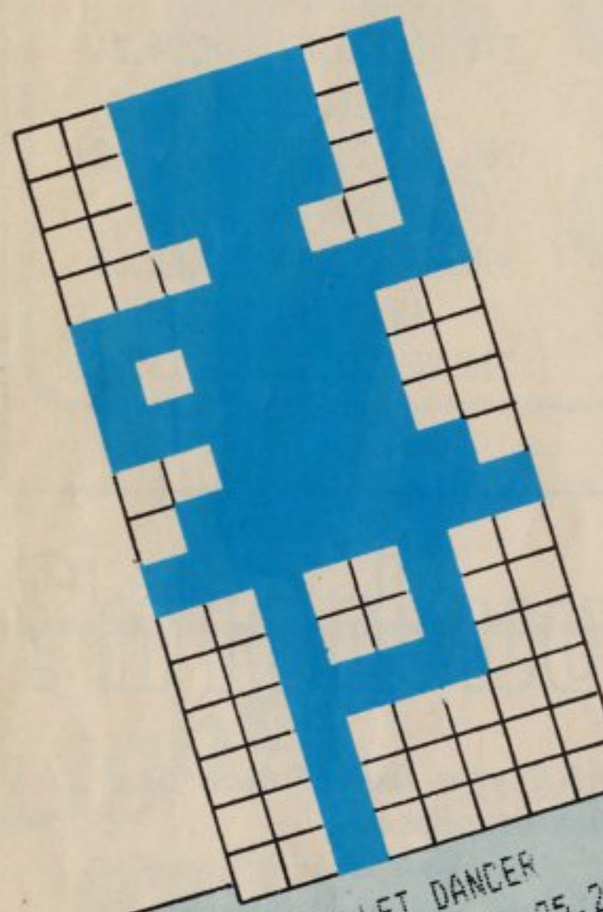
```
10 REM DAY OF THE WEEK
20 REM (C)ELECTRON USER
30 MODE 1
40 VDU 19,7,15;0;
50 COLOUR 129
   :COLOUR 2
60 PRINT TAB(9,4);"DAY
   OF THE WEEK";TAB(6
   ,6)"For the ACORN ELECT
   RON";TAB(6,8);"(c)
    ELECTRON USER 1983"
70 COLOUR 128
80 PRINT TAB(0,12);"Please
    enter:"
90 PRINT TAB(0,15);
   :INPUT "Date  "D
100 PRINT TAB(0,17);
   :INPUT "Month "M
110 PRINT TAB(0,19);
   :INPUT "Year  "Y
120 IF M=0 AND D=0
   AND Y=0
   THEN END
130 IF M<=2
   THEN M=M+12
   :Y=Y-1
140 N=D+2*M+INT (.6*(M+1))+
   Y+INT (Y/4)-INT (Y/100)
   +INT (Y/400)+2
150 N=INT ((N/7-INT (N/7))*
   7+.5)
160 PRINT '''"The day is
   ";
   :COLOUR 7
   :PRINT ;DAY$(N)
170 G=GET
180 UNTIL 0
190 DEF PROCinit
200 DIM DAY$(6)
210 FOR N=0 TO 6
220 READ DAY$(N)
230 NEXT N
240 ENDPROC
250 DATA Saturday,Sunday
   ,Monday,Tuesday,Wednesd
   ay,Thursday,Friday
```

Casting Agency

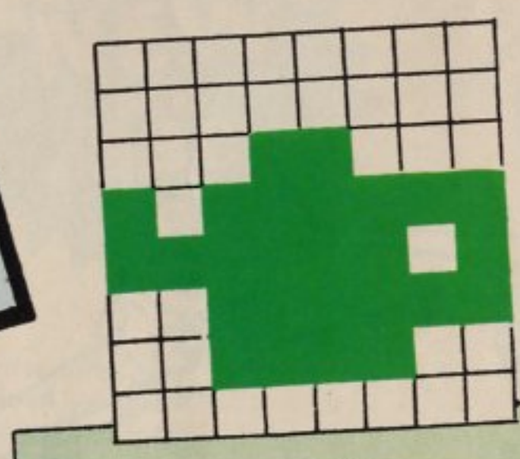




AMBULANCE
VDU23,233,0,15,9,9,127,127,127,48
VDU23,234,0,254,222,142,222,254,254,12



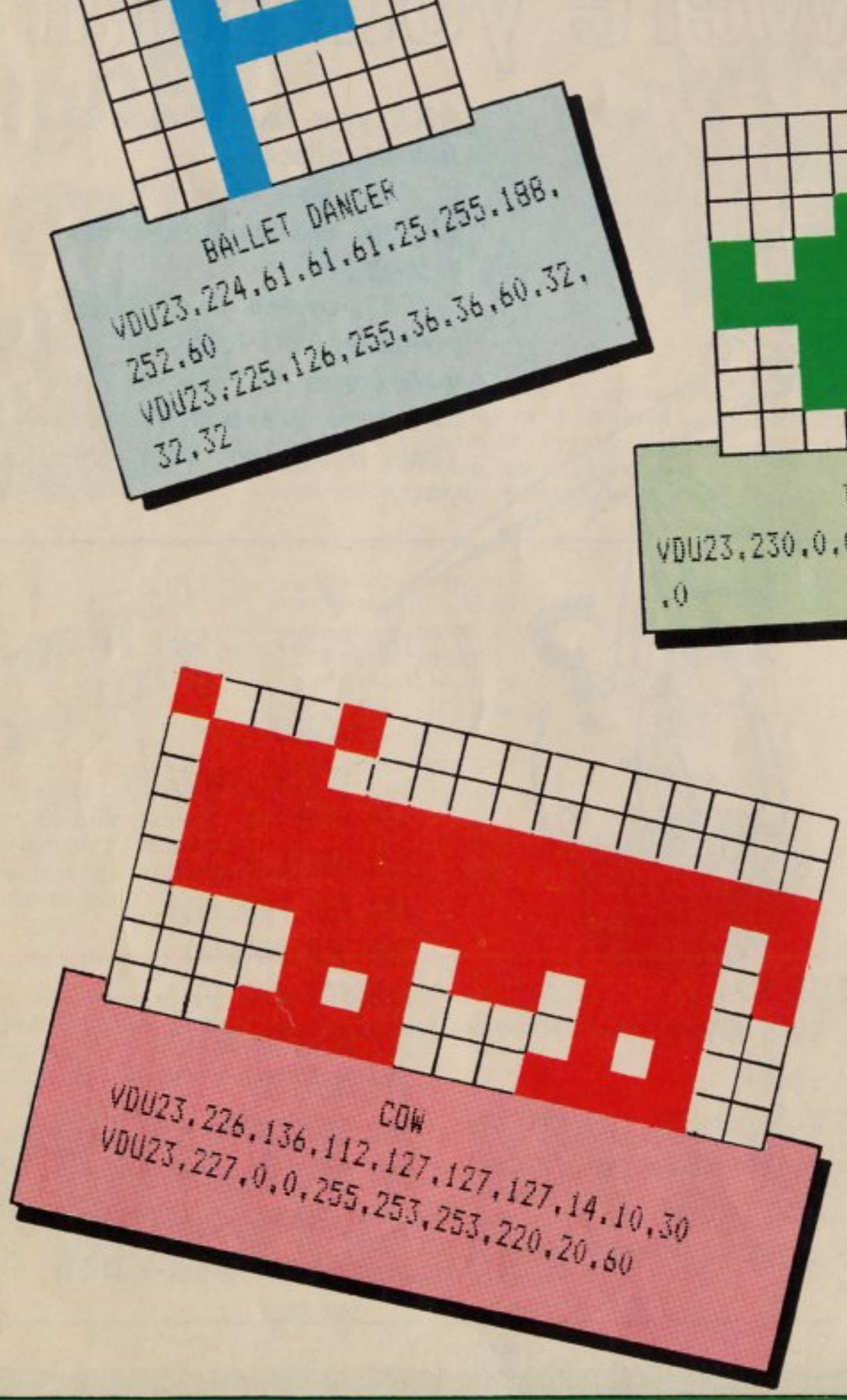
BALLET DANCER
VDU23,224,61,61,61,25,255,188,252,60
VDU23,225,126,255,36,36,60,32,32,32



TEAPOT
VDU23,230,0,0,24,191,253,63,60,0

MAN WITH HAT
VDU23,228,60,255,60,60,60,24,255,189
VDU23,229,189,189,189,36,36,36,36,231

CASTLE
VDU23,231,0,2,3,2,171,255,170,254
VDU23,232,0,160,224,160,235,255,53,63



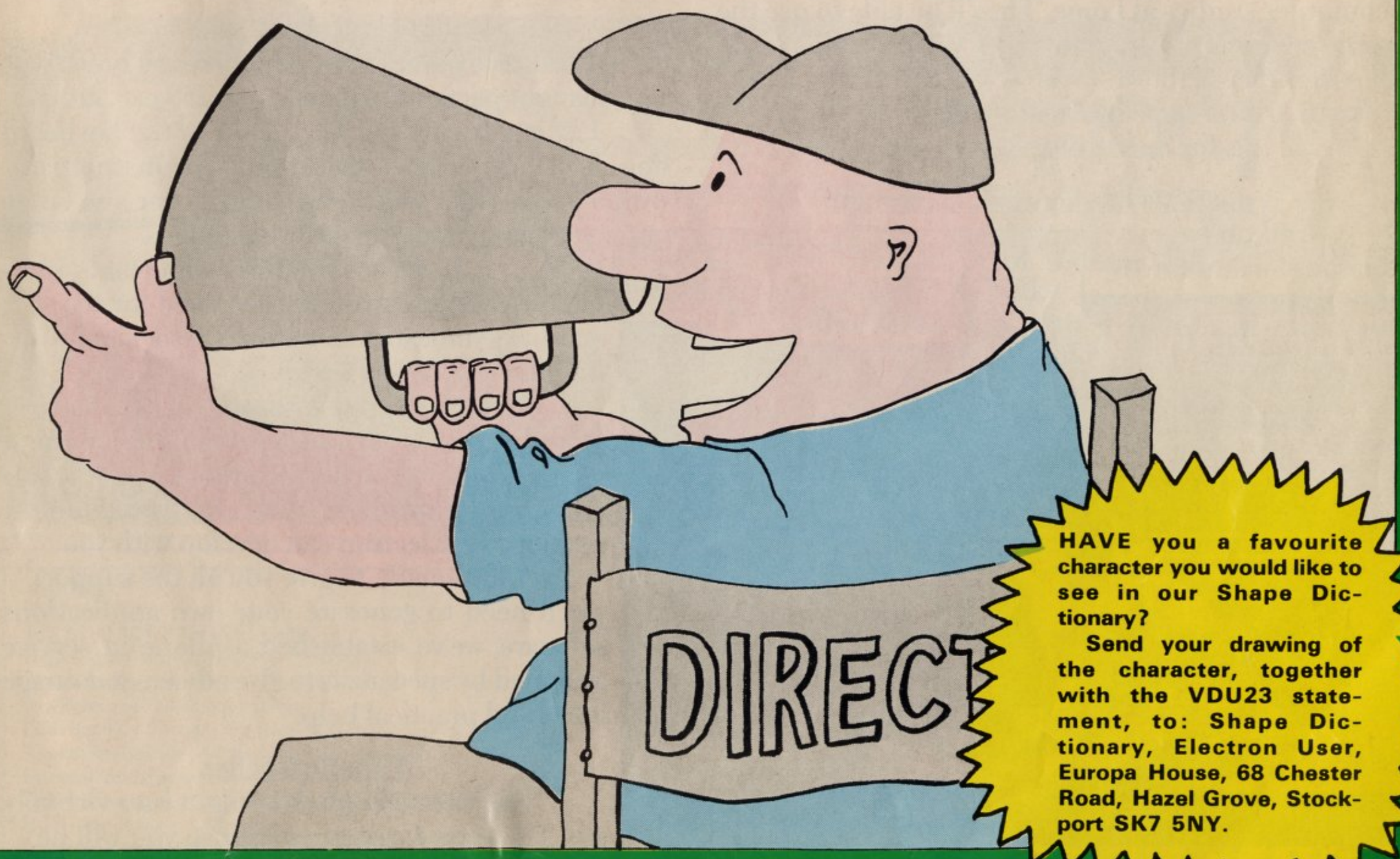
COW
VDU23,226,136,112,127,127,127,14,10,30
VDU23,227,0,0,255,253,253,220,20,60

THIS is the start of the unique *Electron User* Shape Dictionary – an essential source of off-the-shelf user-defined characters which you can incorporate into your own programs.

Over the next few months it will build up into a comprehensive collection that no Electron programmer will want to be without.

Bring these handy characters to life in your own Electron programs with these ready-to-go listings. And there'll be more next month!

```
10 MODE 2
20 VDU 23:8202;0;0;0;
30 PROCDEFINE
40 CLS
   :COLOUR 14
   :PROCBALLET(9,15)
50 PROCPAUSE
60 CLS
   :COLOUR 3
   :PROCCOW(9,15)
70 PROCPAUSE
80 CLS
   :COLOUR 7
   :PROCMAN(9,15)
90 PROCPAUSE
100 CLS
   :COLOUR 2
   :PROCTEAPOT(9,15)
110 PROCPAUSE
120 CLS
   :COLOUR 1
   :PROCCASTLE(9,15)
130 PROCPAUSE
140 CLS
   :COLOUR 5
   :PROCAMBULANCE(9,15)
150 PROCPAUSE
160 GOTO 40
170
180 DEF PROCDEFINE
190 VDU 23,224,61,61,61
    ,25,255,188,252,60
200 VDU 23,225,126,255,36
    ,36,60,32,32,32
210 VDU 23,226,136,112,127
    ,127,127,14,10,30
220 VDU 23,227,0,0,255,253
    ,253,220,20,60
230 VDU 23,228,60,255,60
    ,60,60,24,255,189
240 VDU 23,229,189,189,189
    ,36,36,36,36,231
250 VDU 23,230,0,0,24,191
    ,253,63,60,0
260 VDU 23,231,0,2,3,2,171
    ,255,170,254
270 VDU 23,232,0,160,224
    ,160,235,255,53,63
280 VDU 23,233,0,15,9,9
    ,127,127,127,48
290 VDU 23,234,0,254,222
    ,142,222,254,254,12
300 ENDPROC
310
320 DEF PROCBALLET(X%,Y%)
330 VDU 31,X%,Y%,224,31
    ,X%,Y%+1,225
340 ENDPROC
350
360 DEF PROCCOW(X%,Y%)
370 VDU 31,X%,Y%,226,31
    ,X%+1,Y%,227
380 ENDPROC
390
400 DEF PROCMAN(X%,Y%)
410 VDU 31,X%,Y%,228,31
    ,X%,Y%+1,229
420 ENDPROC
430
440 DEF PROCTEAPOT(X%,Y%)
450 VDU 31,X%,Y%,230
460 ENDPROC
470
480 DEF PROCCASTLE(X%,Y%)
490 VDU 31,X%,Y%,231,31
    ,X%+1,Y%,232
500 ENDPROC
510
520 DEF PROCAMBULANCE(X%
    ,Y%)
530 VDU 31,X%,Y%,233,31
    ,X%+1,Y%,234
540 ENDPROC
550
560 DEF PROCPAUSE
570 A$=INKEY$ (500)
580 ENDPROC
```



HAVE you a favourite character you would like to see in our Shape Dictionary?

Send your drawing of the character, together with the VDU23 statement, to: Shape Dictionary, Electron User, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

The new Electron from Acorn. Ask any child at school why it's worth £199.

Most British children have one thing in common with the new Electron microcomputer: they speak the same language.

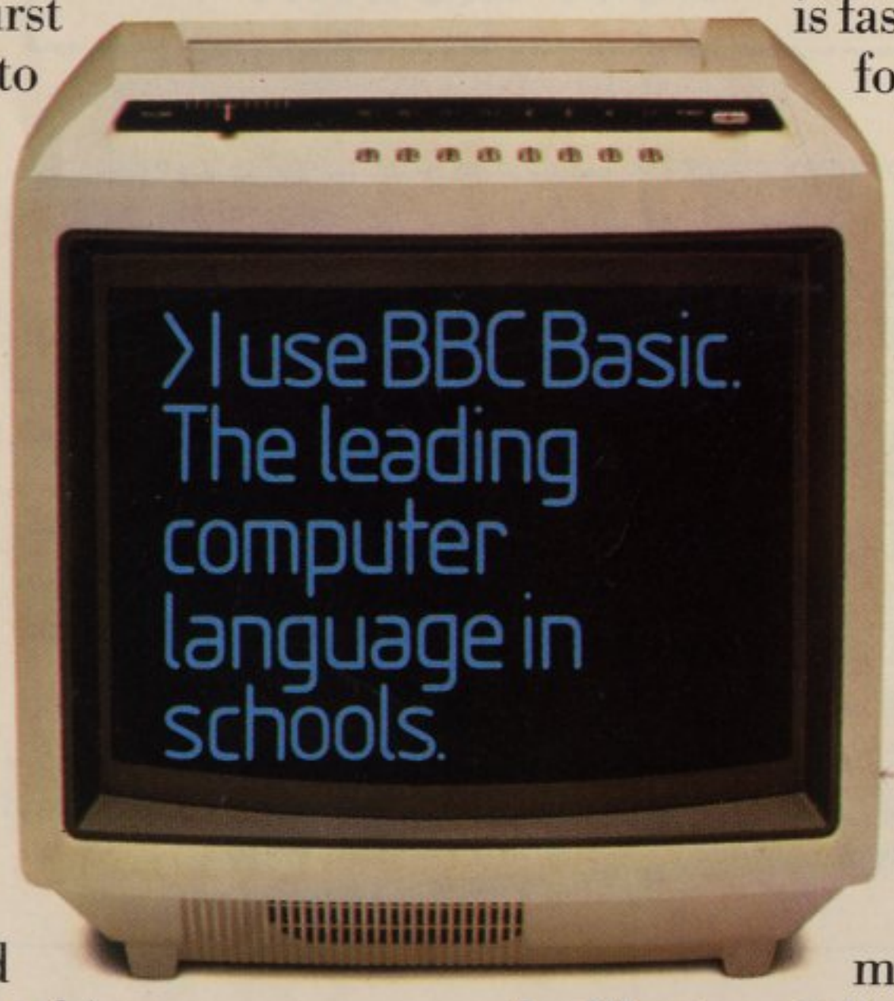
You see, the Electron is the first micro remotely in this price range to use BBC Basic, the computer language that is rapidly becoming the standard in British schools.

But that's not all. Most children will feel at home with the Electron as soon as they lay hands on it.

This is because it has developed out of the Micro that has been chosen by over 80% of schools participating in the Government's current Micros In Schools project. It has a similar keyboard and has most of the functions of this much acclaimed (but naturally, more expensive) machine.

So now children will be able to continue their computer studies at home. They'll be able to use the same educational programs they use at school. And, if asked nicely, they'll be able to help willing adults take their first steps into computing.

All this for only £199.



A micro technology break-through.

And now a few reasons for adults why the Electron is such an exceptional machine at the price.

The Electron is neat and compact. Yet it is fast and powerful. (Full details, for the technically minded, are in the box opposite.)

It produces high quality sound using its own internal speaker.

And it offers a range of facilities many larger more expensive machines just cannot match.

For example the Electron's colour graphics have the highest resolution of any home computer.

This is because the chip that controls the graphics, specially designed by Acorn, is one of the most advanced of its kind. As a result, the Electron delivers twice as many characters across the screen as its closest competitor.

Built to last and to grow.

The Electron has been designed and built to be a permanent part of the family, year in year out.

Particular care has been paid to the keyboard. It is electric typewriter style: robustly constructed with a good, solid 'feel.' It has a space bar, and single entry keys for key commands.

In other words it's comfortable and easy to use, avoiding the need for the manual gymnastics sometimes associated with calculator style keyboards.

And it will grow with you via expansion modules, that Acorn are developing, to take peripheral additions such as printers and disc drives. So as your knowledge, interest and ambitions develop, the Electron can develop with you.

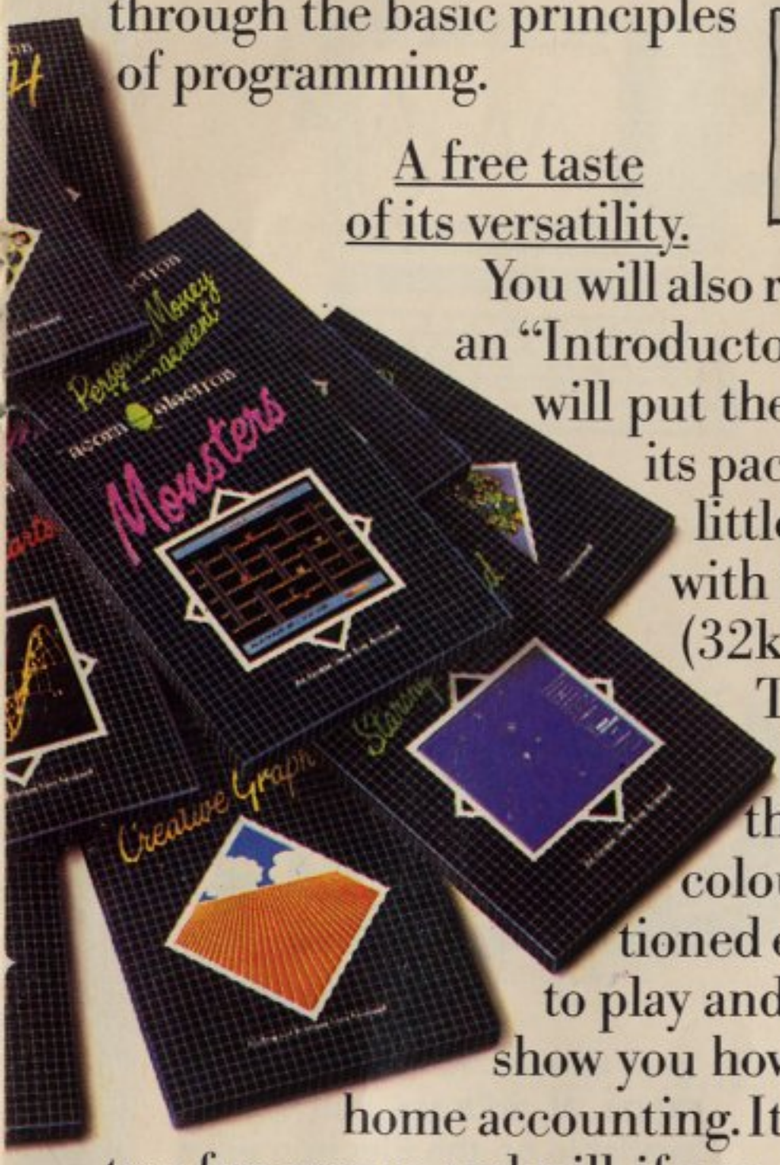
Additionally, to give you all the support you'll need to generate your own applications software, we've established a phone-in service attended by specialists to give advice, encouragement and practical help.

A gentle teacher.

The Electron plugs straight into virtually any TV set and cassette player so you will be

ready to go as soon as you get it home.

It comes not only with a comprehensive user guide, which describes the machine and its functions, but also with a book that takes you step by step through the basic principles of programming.



A free taste of its versatility.

You will also receive an "Introductory" cassette which will put the Electron through its paces showing you a little of what it can do with its 64k of memory (32k ROM, 32k RAM). The cassette will give you a taste of those exceptional colour graphics we mentioned earlier; of its ability to play and notate music, and show you how it might help in home accounting. It will challenge you to a few games and will, if you ask it, do your whole family's biorhythms in a matter of seconds.

You will in short, through the 15 separate programs it contains, get a glimpse of the Electron's potential. But only a glimpse, for that potential is as limitless as your own interest and imagination.

A widening range of software.

To help you realise some of that potential, Electron software already ranges from "Personal Money Management" through "Starship Command" to "Creative Graphics" (which, incidentally, includes some spectacular three-dimensional rotating shapes). Naturally, with its strong educational links, educational software will be extremely important for the Electron and even now O and A Level revision papers are being processed for Electron users.

How to get your Electron.

The Electron is available from selected W H Smith and local Acorn stockists. However, if you would like to order one with your credit card, or if you would like the address of your nearest supplier, just phone 01-200 0200.

Technical Specifications	
Hardware. 2MHz 6502. 32K ROM 32K RAM (64K total). High resolution graphics 640 x 256 max. Seven display modes. 8 colours and 8 flashing colours. 1200 baud CUTS tape interface with motor control. Expansion bus for add-on interface modules. Internal loudspeaker. PAL UHF output to colour or black and white domestic TV. RGB output for colour monitor. 56 key full travel QWERTY keyboard with spacebar.	Software. BBC BASIC. Extensions include interger, floating point and string variables. multi dimensional arrays: IF...THEN...ELSE, REPEAT...UNTIL, procedures with local variables. Operating system allows plot, draw and fill commands. Event timing. Built-in assembler. 6502 assembly language can be mixed with BASIC.

The Acorn Electron.

It doesn't look all that much, but as MIKE COOK explains, it is the gold-plated key to your

EXPANDING electron

HIDING at the back of the Electron, covered by a slip-on plastic protector, is a double sided, gold plated, 50-way edge connector.

No mention of this in the Electron's User Guide, but it is the key to expanding the Electron to include the type of goodies that have made the BBC Micro so popular.

Using this edge connector you can link up circuits that add a printer port, analogue, digital and serial ports, sideways ROMs and disc interface, as well as all the bolt-on goodies that will be developed in the future for the Electron or the BBC Micro.

The table shows the signals that come out of the edge connector.

These are for issue 1 boards, but should stay the same for all issues.

The key shown in place of contact 15 is a slot that prevents the edge connector being placed on the wrong way round.

When the microprocessor wants to access a memory location, it sets the R/W line to a logic one (if it is going to read it) or a logic zero (if it is going to write to it).

The address of the memory location to be used is placed on the 16 lines of the address bus.

These are labelled A0 to A15 and will contain a combination of logic ones and zeroes corresponding to the address required.

This gives a maximum of 65,536 different combinations or addresses and is the maximum amount of memory that the microprocessor can directly access.

In computer terms this is known as 64k, because 1k is a "baker's dozen" thousand – that is, 1024.

When a memory device detects an address on the address bus which corresponds to it, the memory device places the contents of that memory on the data bus.

This is a set of eight wires labelled D0 to D7 but, unlike the address bus, it is bi-directional.

This means it can be an input or an output depending upon whether the microprocessor is reading or writing to a memory location.

There are two signals that can make the microprocessor break off from the program it is executing and, in effect, call a subroutine.

These are known as interrupts, and the two are the NMI (none maskable interrupt) and the IRQ (interrupt request).

In order to synchronise the transfer of data from memory, three clock signals are available.

These are the 16 mHz clock, the 1 mHz clock and the microprocessor's $\emptyset_o$ clock.

The other connections are for the power. One set is for power into the Electron so that a bolt-on device can have a built-in mains transformer of greater capacity than the Electron's plug adaptor.

This still allows the power regulator in the Electron to be utilised.

The regulated power from the Electron is also available on the edge connector to power the bolt-on devices.

The final connection is the audio input/output and may be used by speech synthesisers or high power amplifiers.

It should be noted that the range of address bus signals available on the Electron edge connector is greater than is available on the BBC Micro with its collection of connectors and sockets.

By careful design of add-on circuitry it will be possible to upgrade the Electron to include all the bells and whistles of its big brother.

This gold plated connector is indeed the key to the Electron's expansion.

ELECTRON EDGE CONNECTOR

Component side function	Pin No.	Wiring side function
18v AC in	1	18v AC in
18v AC return	2	18v AC return
–5v	3	–5v
0v	4	0v
+5v	5	+5v
Audio in/out	6	16 mHz clock
1 mHz clock	7	$\emptyset_o$ microprocessor clock
Reset	8	NMI
IRQ	9	R/W
D7	10	D6
D5	11	D4
D3	12	D2
D1	13	D0
not connected	14	not connected
	KEY	
A15	16	A14
A13	17	A12
A11	18	A13
A10	19	A0
A1	20	A2
A3	21	A4
A5	22	A6
A7	23	A8
0v	24	0v
+5v	25	+5v

SOUNDS.. EXCITING

WAILING BUGS

```
ENVELOPE 4,4,-1,1,0,20,20,0,126,0,0,-126,126,126
SOUND1,4,200,100
```

POLICE SIREN

```
ENVELOPE 1,1,-7,7,0,10,10,0,126,0,0,-126,
126,126
SOUND 1,1,136,50
```

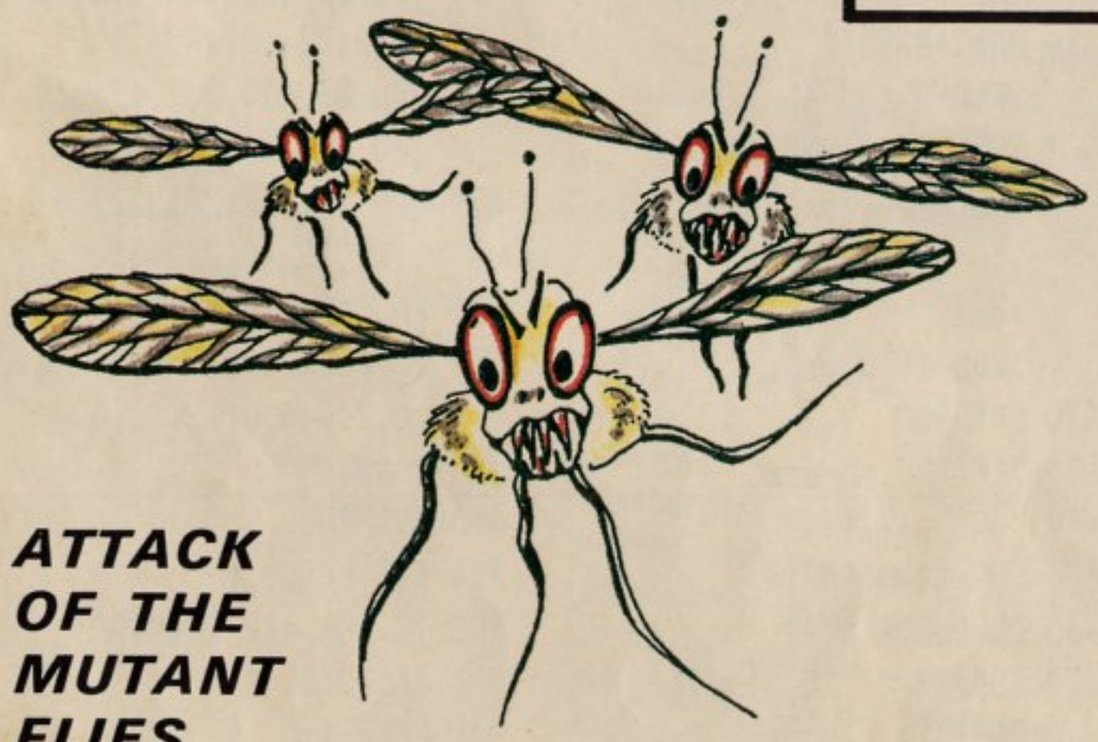
BUILD up a library of exciting sounds to enhance your own programs with these listings. And watch out for more next month!

CRAZY MACHINERY

```
ENVELOPE 5,1,70,6,0,31,10,0,126,
0,0,-126,126,126
SOUND1,5,100,200
```

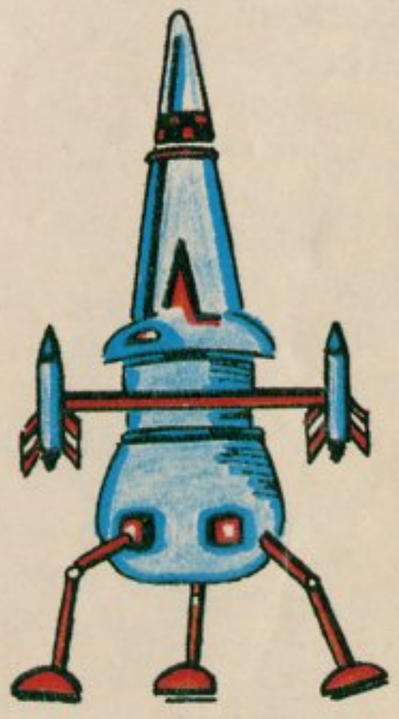
UP, UP AND AWAY

```
ENVELOPE 2,1,1,0,0,200,0,0,126,
0,0,-126,126,126
SOUND1,2,0,40
```



ATTACK OF THE MUTANT FLIES

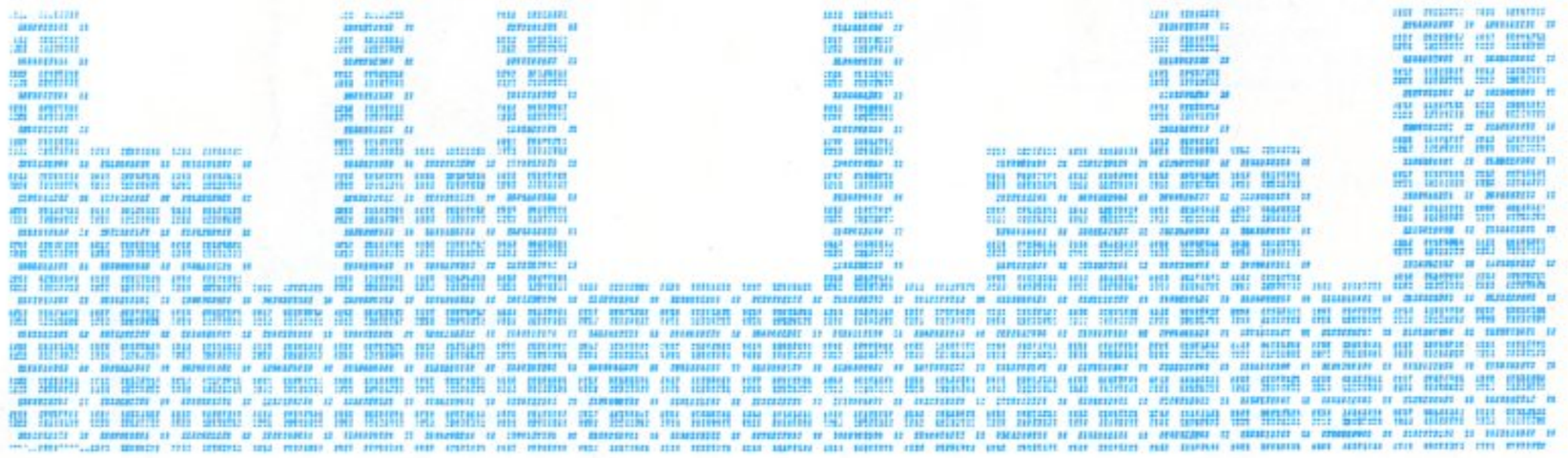
```
ENVELOPE 6,1,36,-36,0,20,20,0,126,0,0,-126,126,126
SOUND1,6,160,100
```



SCORE A HIT

```
ENVELOPE 3,4,90,-15,-15,10,20,20,1
26,0,0,-126,126,126
SOUND1,3,100,20
```

BOMBER STRIKE



YOU are the bomb-aimer of a B17 flying over an enemy city.

Your mission is to drop bombs on the buildings below and obliterate them completely.

The trouble is, it takes more than one bomb run over the target to achieve this and on each successive run you get lower. Get too low and you crash!

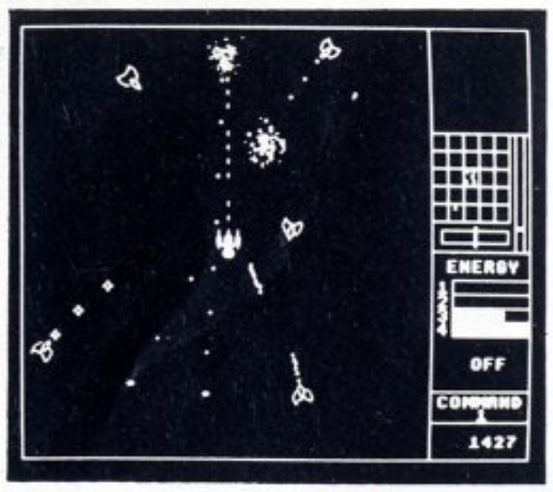
It's up to you. Destroy the city before you become an involuntary kamikazee pilot.

The A key will make you go slower, the S key speeds you up.

Press the Return key and it's bombs away. Good luck!

```
10 REM BOMBER STRIKE
20 ON ERROR PROCerr
30 REPEAT
40 MODE 6
50 *FX12,0
60 *FX15,1
70 VDU 19,7,3;0;
80 PRINT TAB(12,12)"BOMBER
    STRIKE"
90 PRINT TAB(12,14);"A =
    SLOW";TAB(12,16);"S
    = FAST";TAB(12,18);
    "RETURN = BOMB"
100 REPEAT
110 PRINT TAB(12,20);
    :INPUT "SKILL LEVEL 1/6
    "S%
120 UNTIL S%>0 AND S%<7
130 PROCinit
140 REPEAT
150 MODE 2
160 VDU 23,0,8202;0;0;0;
170 PROCscreen
180 V%=-64
    :X%=0
    :Y%=991
    :Z%=FALSE
190 VDU 5
200 REPEAT
210 PROCfly
220 IF FNP(V%,W%)<>0 Z%=TRUE
230 IF INKEY (-74) AND
    NOT G% PROCdrop
240 IF G% PROCbomb
250 UNTIL Z% OR Y%<64
260 IF Z% PROCdead
270 UNTIL MAN%=0
280 VDU 4
    :PRINT TAB(0,5);"FINAL
    SCORE:";SC%'"ANOTHER
    GAME Y/N"
    :VDU 5
290 REPEAT G=GET
    :UNTIL G=78 OR G=89
300 IF G=78 PROCend
310 UNTIL FALSE
320 DEF PROCfly
330 X%=X%+C%
    :IF X%>1216 Y%=Y%-32
    :X%=0
340 PROCplane(X%,Y%)
350 K%=INKEY (0)
    :IF K%=-1 ENDPROC
360 IF K%=65 C%=C%-1
    :IF C%<=10 C%=10
370 IF K%=83 C%=C%+1
    :IF C%>=64 C%=64
380 ENDPROC
390 DEF PROCplane(X%,Y%)
400 GCOL 3,2
410 MOVE X%,Y%
    :VDU 224
420 MOVE V%,W%
    :VDU 224
430 V%=X%
    :W%=Y%
440 ENDPROC
450 DEF PROCdrop
460 SOUND &11,1,200,60
470 A%=X%
    :B%=Y%-64
    :G%=TRUE
480 ENDPROC
490 DEF PROCbomb
500 B%=B%-32
    :IF FNP(A%,B%)<>0
    SOUND &11,0,0,0
    :SOUND &10,-15,4,3
    :MOVE D%,E%
    :VDU 225
    :G%=FALSE
    :PROChole
    :D%=-64
    :ENDPROC
510 IF B%<32 SOUND &11,0
    ,0,0
    :MOVE D%,E%
    :VDU 225
    :G%=FALSE
    :D%=-64
    :ENDPROC
520 MOVE A%,B%
    :VDU 225
530 MOVE D%,E%
    :VDU 225
540 D%=A%
    :E%=B%
550 ENDPROC
560 DEF PROChole
570 MOVE A%,B%
    :VDU 9,9,127,127,127
    ,127,9,9,9,9,10,127
    ,127,127,127
580 VDU 4
    :SC%=SC%+20
    :PRINT TAB(11,0);SC%
    :VDU 5
590 ENDPROC
600 DEF PROCdead
610 MAN%=MAN%-1
    :FOR N=1TO 60
    :VDU 19,0,RND(7);0;
    :SOUND &11,-15,RND(255)
    ,1
    :NEXT
    :VDU 19,0,0;0;
620 ENDPROC
630 DEF PROCscreen
640 LOCAL X%,Y%
650 FOR X%=0 TO 18
660 COLOUR RND(4)
670 FOR Y%=31 TO 31-(S%*
    RND(3)) STEP -1
680 PRINT TAB(X%,Y%);
    :VDU 226;
690 NEXT ,
700 PRINT TAB(5,0);"SCORE:"
710 ENDPROC
720 DEF FNP(X%,Y%)
730 =POINT(X%+32,Y%)
740 DEF PROCend
750 *FX12,0
760 CLS
770 END
780 DEF PROCinit
790 *FX12,1
800 *FX11,1
810 A%=0
    :B%=0
    :X%=0
    :Y%=991
820 MAN%=3
    :SC%=0
830 C%=32
    :D%=0
    :E%=0
    :V%=-64
    :W%=1023
840 Z%=FALSE
    :G%=FALSE
850 VDU 23,224,128,192,224
    ,120,63,120,224,128
860 VDU 23,225,231,126,60
    ,60,60,60,24,24
870 VDU 23,226,222,222,0
    ,125,125,0,222,222
880 PROCplane(X%,Y%)
890 ENVELOPE 1,128,-1,0
    ,0,200,0,0,127,0,0,0
    ,126,0
900 ENDPROC
910 DEF PROCerr
920 IF ERR =17 ENDPROC
930 *FX12,0
940 REPORT
    :PRINT "IN LINE "ERL
950 VDU 22,7
960 END
```

SOFTWARE SURGERY



Starship Command

(Acornsoft)

SPACE is getting awfully nasty nowadays. It seems to be full of aliens all bent on destroying anyone in their path.

In Starship Command you're in charge of a battle starship with the task of ridding space of these hostile elements.

The only weapons you possess are your torpedoes and your skill. The skill consists of being able to manoeuvre your ship into a position where you can zap the other ships which are coming at you thick and fast.

You've got both short and long range scanners which show the enemies' positions as they approach. The position of your ship and the closer attackers is shown on the main screen.

Your ship stays still in the middle of the display, the other ships appearing to move round it as you turn left and right in order to fire at them.

You've also got a rotation meter to tell you how fast you're turning and an indicator of the state of your energy banks.

Should these banks fall to zero your defensive shields collapse and the aliens will destroy you. I did warn you that it's getting nasty out there.

It's not just the aliens you have to look out for, either.

At the end of every mission you are assessed by your superiors. And their judgement can be worse than anything the aliens might hand out.

Even if you do well, all you are rewarded with are other, harder missions.

I can't say that it's easy, but all the information you need is there before you on the various scanner displays.

The game seems to have everything. The graphics are superb, the instructions thorough and, once you get used to the way your ship stays still while the aliens move, the whole thing is enthralling.

Peter Gray

Draughts & Reversi

(Acornsoft)

YOU get two games for the price of one in this package.

The first is Draughts, where you play the Electron at the age-old game or, if you're like me, the Electron plays with you!

You have the choice of eight different levels of play and I can't beat the beast at the easiest level. And it's no use trying to cheat – it won't let me.

The Electron knows all the rules and won't allow an illegal move. In fact, if you give it half a chance it will 'huff' you!

It's a lovely version of the game. You play on a tastefully coloured board, using the keyboard or joysticks to make your move.

Simple to learn and fun to play, it's easy to get carried away and forget that you've got another game on the tape ... and the other game is even better.

Reversi is an old logic game played on an eight by eight grid of squares between two opponents. Once again, it's you playing the Electron.

The aim is to trap its pieces between two of yours and so turn them into your colour. The winner is the one with the most pieces when no more moves can be made.

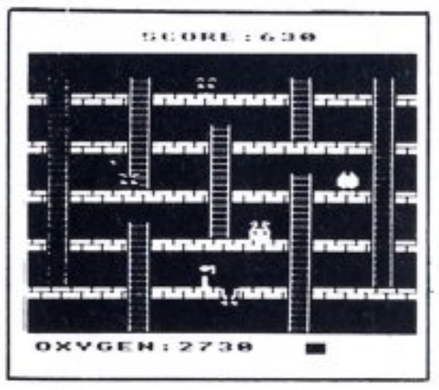
It's a classic game, can be learnt in a couple of minutes, but takes a lifetime to master. And your ever-faithful Electron will be there waiting to give you practice.

You have the choice of nine levels of difficulty and can use either the keyboard or joysticks.

The display makes full use of the Electron's graphics and you can even "take back" any moves that you regret.

All in all, it's a great little package. Each game by itself is good value. Together they're a bargain.

Nigel Peters



Monsters

(Acornsoft)

IN Monsters the screen becomes a pattern of walls and ladders, along which you, in the guise of a little animated man, are chased by a series of colourful monsters.

You've only got three lives and every time they catch you, you lose a life.

To make things more difficult, while you're dashing along the tops of the walls and running up and down the ladders your oxygen supply is running out.

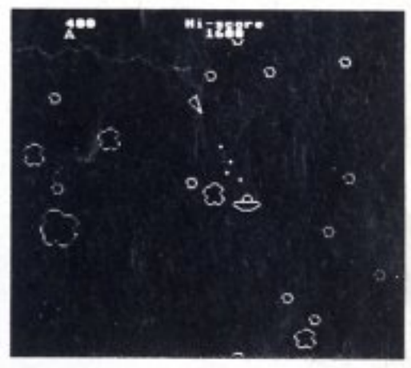
You have to destroy the monsters before that happens, and the only way to do this is to dig a hole in a wall, lure the monsters into it and fill it in quickly before they can climb out.

However, as soon as you get rid of one set of monsters they're replaced by another lot of a different colour.

It gets faster and faster and more and more fun. The graphics are excellent and the instructions easy to follow.

It's also compulsive, making you ask for the notorious "one more go". You could say monsters grow on you.

Peter Gray



Meteors

(Acornsoft)

DRIFTING alone in space your ship is menaced by a sudden meteor storm. Collision is imminent.

All that you have to fight off the huge rocks are your ship's laser bolts. The trouble is that as soon as you hit them the meteors break up into little pieces which are just as deadily.

You have to blast away at these until they've all been destroyed or they'll destroy you!

Just to make things more difficult, all the firing has attracted the attention of some extremely hostile flying saucers.

These take the opportunity to snipe at you while you're distracted by the meteors, so you've got to shoot at them as well.

You do have thrusters to help you dodge, and if it all gets too much you can escape into hyperspace.

It's great fun, a game of quick thinking and fast reactions. Colourful and fast, space flight will never seem the same again.

Nigel Peters

ARCADE ACTION FOR THE BBC MICRO 32K

SENTINEL

In a far quadrant of space are the single dimension gateways to the anti-matter world of Migon.
You must stop the constant bombardment of anti matter plasm bolts and meteors in sectors 1 and 2 and the probe vessel in sector 3.
It will be a constant race as the network of laser walls dissolve and they escape into free space.

6·95

CENTIPEDE

You are caught in a vicious jungle of giant insects. Centipedes are attacking you from all sides. Killer fleas are dropping from the sky, and to top things off there's a venemous spider lurking in the background. You only have your trusty laser cannon as defense.

6·95

INVADERS

A superb example of this truly classic arcade game. Includes all the features of the original and much, much more.

6·95

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